

Request for Continued Examination
USSN 10/660,948

Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Amended) A process for making a stabilized polyalkenyl sulfonic acid comprising:
 - (a) reacting a polyalkene with SO₃ in a first reaction vessel thereby producing a polyalkenyl sulfonic acid product; and
 - (b) stabilizing the product of step (a) by neutralizing with a neutralizing agent as the product of step (a) exits the first reaction vessel and prior to or concurrently with entering a second vessel for further reaction or storage; wherein neutralization occurs in the absence of ammonia or sodium hydroxide; wherein the time between when the polyalkenyl sulfonic acid product leaves the first reactor and is stabilized by neutralization is between 2 seconds and one hour.
2. (Original) The process according to Claim 1 wherein the neutralizing agent is an alkaline earth metal hydroxide.
3. (Original) The process according to Claim 1 wherein the product of step (b) contains less than 20% sultones.
4. (Original) The process according to Claim 1 wherein the polyalkenyl group is a polyisobutenyl group.

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5. (Previously Amended) The process according to Claim 4 wherein the polyisobutenyl group is derived from polyisobutene containing greater than 20 mole percent of ~~alkyvinylidene~~ alkyvinylidene and 1,1-dialkyl isomers.
6. (Original) The process according to Claim 5 wherein the polyisobutenyl group is derived from polyisobutene containing greater than 50 mole percent of alkylvinylidene and 1,1-dialkyl isomers.
7. (Original) The process according to Claim 6 wherein the polyisobutenyl group is derived from polyisobutene containing greater than 70 mole percent of alkylvinylidene and 1,1-dialkyl isomers.
8. (Original) The process according to Claim 2 wherein the alkaline earth metal hydroxide is calcium hydroxide.
9. (Original) The process according to Claim 1 wherein the polyalkene has a number average molecular weight of about 300 to about 1000.
10. (Original) The process according to Claim 9 wherein the polyalkene has a number average molecular weight of about 300 to about 750.
11. (Original) The process according to Claim 10 wherein the polyalkene has a number average molecular weight of about 350 to about 600.
12. (Original) The process according to Claim 1 wherein the amount of fragmentation in the product of step (b) is less than about 15%.

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13. (Original) The process according to Claim 1 further comprising mixing a carboxylic acid with the polyalkene prior to reacting with SO₃.
14. (Original) The process according to Claim 13 wherein the polyalkene is polyisobutene.
15. (Original) The process according to Claim 14 wherein the polyisobutene has a number average molecular weight of at least about 300 to about 1000.
16. (Original) The process according to claim 13 wherein the carboxylic acid is acetic acid.
17. (Original) The process according to Claim 1 further comprising diluting the polyalkene prior to reaction with SO₃.
18. (Original) The process according to Claim 16 wherein the diluted polyalkene is mixed with carboxylic acid prior to reaction with SO₃.
19. (Original) The process according to Claim 1 further comprising the step of overbasing the neutralized product of step (b) with an alkaline earth metal basic salt.
20. (Original) The process according to Claim 19 wherein water is used as a promoter.
21. (Original) The process according to Claim 20 wherein the amount of water used is from about 0.5 to about 8.0 wt% of the total stabilized polyalkenyl sulfonic acid.

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22. (Original) The process according to Claim 19 wherein the overbasing temperature is from 100°C to about 170°C.
23. (Original) The process according to Claim 19 wherein the overbasing pressure is from about 25 to about 65 psia.
24. (Currently Amended) A process for overbasing stabilized polyalkenyl sulfonic acids comprising consisting essentially of overbasing the a stabilized polyalkenyl sulfonic acid with an alkaline earth metal basic salt, and wherein water is used as a promoter and wherein the stabilized polyalkenyl sulfonic acid is prepared by a process comprising
 - (i) reacting a polyalkene with SO₃ in a first reaction vessel thereby producing a polyalkenyl sulfonic acid product; and
 - (ii) stabilizing the product of step (a) by neutralizing with a neutralizing agent as the product of step (a) exits the first reaction vessel and prior to or concurrently with entering a second vessel for further reaction or storage, wherein neutralization occurs in the absence of ammonia or sodium hydroxide; wherein the time between when the polyalkenyl sulfonic acid product leaves the first reactor and is stabilized by neutralization is between 2 seconds and one hour.
25. (Currently Amended) The process according to Claim 24 wherein the amount of water used is from about 0.5 to about 8.0 wt% of the stabilized polyalkenyl sulfonic acid.

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26. (Previously Amended) The process according to Claim 25 24 wherein the overbasing temperature is from 100°C to about 170°C.
27. (Previously Amended) The process according to Claim 25 24 wherein the overbasing pressure is from about 25 to about 65 psia.